$u = \cos x \qquad du = -\sin x\,dx$

$$\int \sin x \cdot e^{\cos x}\,dx = -\int -\left(\sin x \cdot e^{\cos x}\right)dx$$

$$= -\int \left(e^{\cos x}\right)\cdot\left(-\sin x\right)dx$$

$$= -\int e^{u}\,du$$

$$= \left(-1 \cdot e^{u}\right) + C$$

$$= \boxed{-e^{\cos x} + C}$$

Evaluate $\int x^2\sqrt{5+2x^3}\,dx$

$u = 5+2x^3 \qquad du = 6x^2\,dx$ ← Anti-derivative of "u".

$$\int x^2\sqrt{5+2x^3}\,dx = \int (5+2x^3)^{1/2}\cdot x^2\,dx$$

$$= \frac{1}{6}\int (5+2x^3)^{1/2}\cdot 6x^2\,dx$$

*When multiplying by 6, you also have to multiply it by 1/6.

$$= \frac{1}{6}\int u^{1/2}\cdot du$$

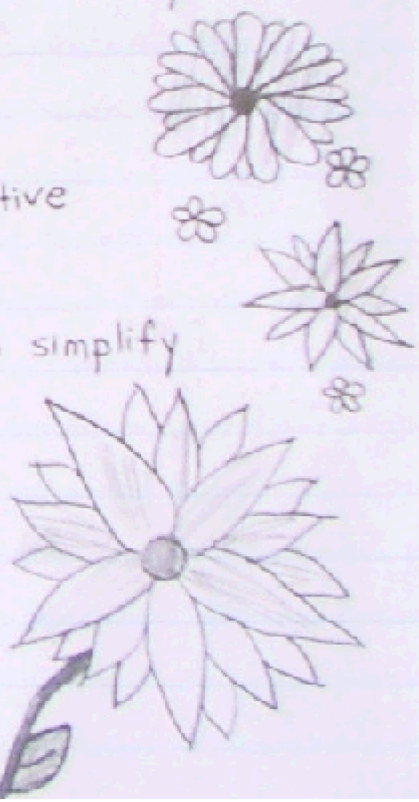
*Take the anti-derivative

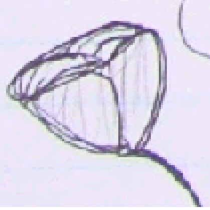
$$= \frac{1}{6}\left(\frac{2}{3}\right)u^{3/2} + C$$

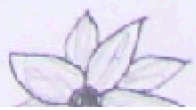
*Plug $5+2x^3$ in for u and simplify

$$= \frac{1}{9}(5+2x^3)^{3/2} + C$$

$$\frac{1}{9}(5+2x^3)^{3/2} + C$$







$$\int \cot 7x \, dx = \int \frac{\cos 7x}{\sin 7x} \, dx$$

$\frac{7}{7}$ $\qquad \frac{1}{7} \int \frac{7\cos 7x \, dx}{\sin 7x}$ $\qquad u = \sin 7x$

$du = 7\cos 7x \, dx$

$$\frac{1}{7} \int \frac{du}{u} \qquad \frac{1}{u}\,du$$

$$\frac{1}{7} \ln |u| + C$$

$$\frac{1}{7} \ln |\sin 7x| + C$$

$$\int \cos^3 x \cdot dx = \int (\cos^2 x) \cos x \cdot dx$$ → setup for Trig identity

$$= \int (1 - \sin^2 x) \cos x \cdot dx$$ → Trig Identity Substitution

$$= \int (1 - u^2) \cdot du$$

$u = \sin x$

$du = \cos x \cdot dx$

$$\boxed{\frac{du \cdot dx}{dx}}$$

$$= u - \frac{u^3}{3} + C$$

$$= \sin x - \frac{\sin^3 x}{3} + C$$

$u = \tan x \qquad \dfrac{du}{dx} = \sec^2 x$

$\cdot dx$

$du = \sec^2 x \, dx$

$$\int_0^{\frac{\pi}{3}} \tan x \sec^2 x \, dx = \int_0^{\frac{\pi}{3}} u \, du \qquad \int_0^{\sqrt{3}} u \, du$$

$$F(x) = \frac{u^2}{2} \qquad \frac{(\sqrt{3})^2}{2} - \frac{0^2}{2} = \frac{3}{2}$$

plug in $\tan x$ in for u

$$\frac{(\tan(\frac{\pi}{3}))^2}{2} - \frac{(\tan(0))^2}{2} = \frac{3}{2}$$

Do:

17-24 $\left(\frac{1}{2}\right)$

25 - 46 $\left(\frac{1}{2}\right)$